

Monitoring of effects occurs at many levels, including at the Forest level, species level, and finally the project level. Each of these can and are divided into smaller sub categories. Examples of Forest level monitoring examples include vegetative cover type, timber strata, vegetative diversity, fire management, and watershed conditions. Examples of species level monitoring include, anadromous fisheries habitat, bald eagles and their habitat, northern spotted owls and their habitat. For further information regarding Forest and species level monitoring, please refer to Chapter 5 of the LRMP, Table 5-1 illustrates the types of monitoring and the associated indicators and measures. Project level monitoring is also divided into subcategories, for the Dubakella project proposed monitoring includes both implementation monitoring and effectiveness monitoring, combined with project analysis.

Dubakella Project Monitoring Plan

Below summarizes much of the planned monitoring for the Project.

Vegetation and Forest Health

Plot data from treatment areas is gathered at the following times:

- Pre-scoping - The Dubakella Watershed was designated under HFRA using national protocols (i.e. National Risk Viewer projection assessment) to identify areas at an increased risk from forest insects and tree diseases. After the designation, vegetation data to determine species composition, size distribution, and stand density was collected in the proposed treatments areas and was utilized in the project design and analysis. The project area was also visited and assessed by our provincial Forest Health staff to assess the current condition of insects and disease.
- Pre-treatment - Prior to inclusion in a timber sale or service contract – this data is used by the government to develop the contract and contractors to bid on the timber sale or service contract. Plot density is determined by the type of contract and the diversity of the landscape being treated.
- During treatment – implementation monitoring is conducted by unit staff or sale administration depending on the type of contract, to insure contract specifications are met and BMPs are being followed.
- Post-treatment - Plots will be installed congruently with unit layout for each prescription type.
 - Data utilizing both photo point monitoring and Common Stand Exam (CSE) plots. As part of the CSE plots, the condition of tree crowns, damage, and mortality will all be characterized.
 - These more intensive plots will be a subset of the pretreatment plots (approximately 10 percent).
 - Re-examination of plots post-treatment will occur within 1 – 5 years after treatment. Additional sampling will be conducted, generally 5 – 10 years post-treatment, to assess the need for maintenance treatment(s).
 - Data will be summarized the winter after data collection is complete.

Fuels

- Pre-scoping-Remotely-sensed data describing surface fuels and canopy characteristics (as inputs for fire behavior modeling) was field-verified by the fuels specialist. This data was used in the project design/analysis.
- Pre-treatment plots-this data, describing surface fuels and vegetation characteristics, is used in the burn plan design and as a baseline for comparing post-treatment results. Data can be

collected through a variety of sampling procedures. Photo points are a common element of the sampling protocols.

- During treatment- Weather and fire behavior observations are recorded during prescribed fire operations so that correlations to fire effects can be established and future burn prescriptions can be refined. Real-time monitoring during treatment can also be used to adjust tactics and techniques to meet objectives while implementing a prescribed fire.
- Post-treatment- Pre-treatment plot locations will be revisited using the same protocols to measure change in surface fuels and vegetation.
 - Post-treatment sampling will occur within 1 – 5 years after treatment. Additional sampling will be conducted, generally 5 – 10 years post-treatment, to assess the need for maintenance treatment(s).
 - Composite Burn Index (or a similar protocol for assessment of fire effects and burn severity) will be used to evaluate changes in the natural stands (and in NSO habitat in particular) across all strata/layers.

Physical Sciences-Hydrology/Geology/Stream

Various types and levels of hydrologic monitoring occurs regularly or is planned as part of this project, examples include:

- Legacy Sediment Site Inventory- This data was used in this analysis
- Best Management Practices Monitoring-This is national standardized monitoring that occurs both during and post implementation.
- Stream temperature monitoring- Project specific, planning to monitor pre- and post-treatment temperature in a few stream reaches within and downstream of treated areas.

Botany

- Pre-decision- GIS analysis of survey status and habitat types, site visits/surveys, and flagging of known sites, all incorporated into project design.
- Implementation-Project specific RPMs to mitigate effects to sensitive species as well as prevent the introduction and/or spread of invasive species. Flagging also refreshed to ensure sites aren't inadvertently entered.
- Effectiveness review of site specific RPMs- post project to assess how well they were implemented.
- Provide reports of sensitive plant populations to the California Natural Diversity Database (CNDDDB) at the Department of Fish and Wildlife annually.

Wildlife

- Pre-decision- GIS analysis of survey status and habitat types, site visits and surveys were all incorporated into project design.
- Implementation-Project specific RPMs to mitigate effects to sensitive species, habitats, and important habitat elements. Fire behavior observations are recorded during prescribed fire operations in suitable NRF habitat for NSO so that correlations to fire effects can be established and future burn prescriptions can be refined.
- Effectiveness-Site visits during and after project to assess RPMs were implemented and worked as planned.

Archaeology

- Pre-decision- GIS analysis of survey status, surveys of areas not previously done, with the exception of impenetrable brushy areas (as defined in Appendix H of the Regional Programmatic Agreement). Sites are flagged and avoided in most cases. Limited hand treatments can occur in some sites, but no mechanized work will be conducted.
- Implementation-Site flagging refreshed to ensure sites aren't mistakenly entered.
 - Brushy areas that were not surveyed prior to implementation are surveyed once they can physically be entered.
 - If new cultural resources are discovered during implementation all work in the vicinity should cease until the District Archaeologist examines and assesses the resource. Appropriate measures will then be undertaken to protect the new resource as activities resume and the process outlined in the R5 PA will be followed (R5 PA 7.10, page 21).
- Effectiveness-Site visits during and after project to assess if sites were impacted by treatments.